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Terrestrial Isopods from Sri Lanka II: *Exalloniscus brincki* n. sp. (Crustacea, Malacostraca)

by

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With 3 figures

ABSTRACT

The present knowledge on the taxonomic status of the species of the genus *Exalloniscus* Stebbing, 1911 is clarified and a new species, *E. brincki*, is described.

The lands surrounding the South Chinese Sea seem to be the dispersal center of the genus.

The new insular species, together with the mountain species *E. nepalensis*, would be the result of a subsequent westward migration to the Indian subcontinent.

Among the many Crustaceans Isopods collected about one century ago by Prof. Weber in Java and Sumatra, DOLLFUS (1898) found two new species that he attributed to the genus *Alloniscus*: *A. coecus* and *A. albus*. The diagnosis and the drawings provided in this occasion are very approximate, but however sufficient to enable BUDDE-LUND (1908) to doubt this generic attribution. Both species showed a three-jointed antennal flagellum, that excludes their belonging to the family Scyphacidae sensu DANA (1852) and therefore to the genus *Alloniscus*.

Later, Rev. STEBBING (1911), working on material coming from West India (Mad-dathorai, Travancore) thought to recognize *A. coecus*. Agreeing with BUDDE-LUND (1908) intuition, he based on this material the genus *Exalloniscus*. The type species, *E. coecus*, was consequently distributed in a large area from India to Java.

We report hereafter the genus diagnosis proposed by Stebbing of Dollfus indications, and recently reviewed by SCHMALFUSS (1983): oval body, lightly convexe, covered with

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granulations more evident anteriorly, frontal and suprantennal lines present, second antenna flagellum three-jointed. Pleon epimera well developed, continuing the body outline of the pereion. Pleopods exopodites without breathing organs. Telson longer than wide, triangular shaped. The uropod basipodite is as long as or longer than the pleon. The exopodites are small, even if longer than the telson.

We eliminated the mouth-parts and the pereiopods characters reported by Stebbing because they are unknown in most species and therefore have little diagnostic value.

We find useful a brief summary of the knowledge available on the species of the genus, to evidence the fragile bases on which the taxonomy of some species stands and the limits of any kind of speculation in phylogenesis.

This long introduction will permit to insert the new species, which will be later discussed, within the genus.

The new species is described on specimens collected during research expeditions carried out by the Museum of Natural History of Genève and the Lund University.

The present study follows the first by ARGANO and MANICASTRI (1979) on the terrestrial Isopods collections from the above mentioned Sri Lanka's expeditions.

***Exalloniscus coecus* (Dollfus, 1898)**

As reported above, it is evident that STEBBING (1911) didn't have enough indications to establish the conspecificity between the Indian specimens he studied and the species described by Dollfus. The description given by the French author leaves many possibilities of interpretation and permits at the most to recognize a congenericity. In the Zoologisch Museum of the Institut Voor Taxonomische Zoologie in Amsterdam, there is a little vial with the label: *Alloniscus coecus* Dollfus n. sp., Kajoe Tanam. It is the type locality in Sumatra from which Dollfus cited 2 females in his paper. The vial contains one male and one female, and an isolated pleon of a second male. Apart from the lack of correspondence on sex and on the specimens' number, the material is severely damaged, so that it is only possible to confirm the genus diagnosis: it is an *Exalloniscus*, but it cannot be classified as *E. coecus* sensu Stebbing.

A second vial preserved in the same Museum is labelled *Alloniscus coecus* Dollfus n. sp., Buitenzorg. This place corresponds to the second area, in Java, indicated by Dollfus in his paper, but the vial contains the remains of a terrestrial Isopod which can not be recognized. The only certain fact is that it is not an *Exalloniscus*.

The species is also named for Kuala Legap, Malaysia (JACKSON, 1936) in a paper in which the details of the mouth parts are described, even if this does not lead to a better knowledge of the species. Jackson bases his diagnosis on Stebbing's work, but he does not seem to have examined male specimens.

The species was named by FERRARA and TAITI (1982) for Port Blair, South Andaman, on the basis of a female specimen. It constitutes a valid indication at a generic level, but requires a confirmation at a specific level.

To summarize, *Exalloniscus coecus* (Dollfus), sensu Stebbing, is present in West India, probably in Malaysia. A blind *Exalloniscus* lives in the Andamane Islands, in Java and Sumatra (type localities), but it not sure that it is the same species. The taxonomic status of the species is evidently to be confirmed.

***Exalloniscus albus* (Dollfus, 1898)**

This species comes in and out without apparent reasons from the specialised literature, leaving a fragmentary trail in the Dutch Museums.

Dollfus' description, sub *Alloniscus*, is based on two specimens (one male and one female) coming from Manindjau (Sumatra). As for the previous species, BUDDÉ-LUND (1908) and ARCANGELI (1958) doubt about its belonging to the genus *Alloniscus*. Arcangeli says to have studied material of this species conserved at the Leyden Museum, but does not furnish any new information nor drawings. Dollfus' original drawings represent a whole individual, too long and without the characteristic lateral lobes to be an *Exalloniscus*, an improbable pleopod I and a cephalon.

The disappearance of this species from later papers (see FERRARA and TAITI, 1982; TAITI e FERRARA, in press; SCHMALLFUSS, 1983) is not surprising. These hazy indications were anyhow sufficient for Arcangeli to recognize the species *E. albus* in the material from Sumatra conserved in the Leyden Museum.

The vial of type specimens (one beheaded male, one beheaded female, and a cephalon without antennae) from Amsterdam Museum is hand labelled by the author: *Alloniscus albus* Dollfus n. sp., Manindjau.

The genus *Exalloniscus* is recognizable by the characteristic cephalic lobes. This material is in such bad conditions that it cannot permit widenings.

It was not possible, for instance, to find the eyes described by Dollfus. It also seems that the pleopods, at present badly damaged, were drawn in situ.

In the Leyden Museum there are the remains of a specimen which can not be identified, surely not belonging to the genus *Exalloniscus*, with the following indication (which seems hand written by Dollfus): *Alloniscus albus*, Tjibodas.

Among the 3 individuals studied by ARCANGELI in 1958, only one is left, which is completely dried up, and that can be described as an eyed *Exalloniscus*, with the telson edges slightly sinuous, as in type specimens. Two labels are attached to the remains of this specimen: one has the following indication: Kamang, Sumatra Is. 297, L. JACOBSON 1913, *Exalloniscus albus* Dollfus m. The second one is incomprehensible; it is only possible to deduce from this label the primitive presence of 3 specimens in the vial.

JACKSON (1936) quotes dubiously *A. albus* Dollfus from Lumu Lumu and Kamboranda (Malaysia). It is a work in which the species is strangely referred to as belonging to the genus *Alloniscus*, whereas the author names in an other page the genus *Exalloniscus* and STEBBING'S 1911 paper. The data are based on 2 females in bad conditions; no drawings nor descriptions are reported.

We therefore agree with Jackson to ignore completely this indication.

To sum up, there is in Sumatra an *E. albus* provided with eyes and with a telson with sinuous edges, therefore different from the species treated before. Apart from the type locality, it is wise to suppose that the species also lives in Kamang. At the moment, it seems difficult to add something else.

***Exalloniscus cortii* Arcangeli, 1927**

Among the very rich material collected in the Far East by Prof. F. Silvestri in 1925, Arcangeli found 5 males and 18 females of a new species of *Exalloniscus*: *E. cortii*.

The material came from a very large area which included parts of China, Korea and Japan. It is an eyed form, with evident dorsal granulations, characterised by a peculiar distant membranous lobe on the endopodite of pleopod I.

As is often happens in terrestrial Isopods, no diagnostic characters are provided for the females. It would be useful at least to quote the localities where also males are known. The species was occasionally found in Korea associated with ants (as *E. albus* from Sumatra), and seems to reproduce in June and July.

NUNOMURA (1980) quotes this species for Japan, in a leaf litter zone of pine forest at Hikatae.

***Exalloniscus nepalensis* Schmalfuss, 1983**

It is an eyed form similar to *E. albus*, as far as it is possible to assert it on the bases of the exposed data, and was collected in two primary forests of high altitude (more than 2600 m) near Katmandu and in the easternmost part of Nepal.

***Exalloniscus rotundatus* Taiti and Ferrara**

Recently described for Hong Kong, it is characterized, apart from the peculiar rounded body shape, by a single large ocellus and by the complexity of the pleopod I endopodite.

***Exalloniscus papillosus* (Budde-Lund, 1912)**

Discovered by Jacobson in 1909 in Java, it was described by Budde-Lund as *Kisuma papillosa*. Only recently the analysis of the type material permitted to TAITI and FERRARA (in press) to put in synonymy the genus *Kisuma* with *Exalloniscus*.

It is an eyed form, clearly distinguishable from the other species by the structure of the male pleopod I.

***Exalloniscus brincki* n. sp.**

MATERIAL EXAMINED: Sri Lanka W. Prov. Yakkala, 18 mls NE Colombo: 3♂♂ (1 juv.), 1♀, 15-31.1.1962 (in heaps of coconuts shells); Sabaragamuwa, Prov., Deerwood-Kuruwita, 6 mls, NNW Ratnapura (under bark of logs): 1♀, 15-21.2.1962. P. Brinck, H. Anderson, L. Cederholm legerunt (Lund University).

Sri Lanka, Kegalla: 1♂ juv. 14.1.1970. C. Besuchet, I. Löbl legerunt (Museum of Natural History, Genève).

The ♂ holotype (from Yakkala) and 1♂ juv. paratype (from Kegalla) are deposited in the Museum of Natural History, Genève; 4 paratypes in the Lund University (one partially dissected for the S.E.M. analysis).

DESCRIPTION: Maximum length: ♂ 4,5 mm — ♀ 3 mm.

The body surface shows a series of protuberances, each one of which, through S.E.M. analyses, has been observed to carry on its top three leaf like structures which seem to come

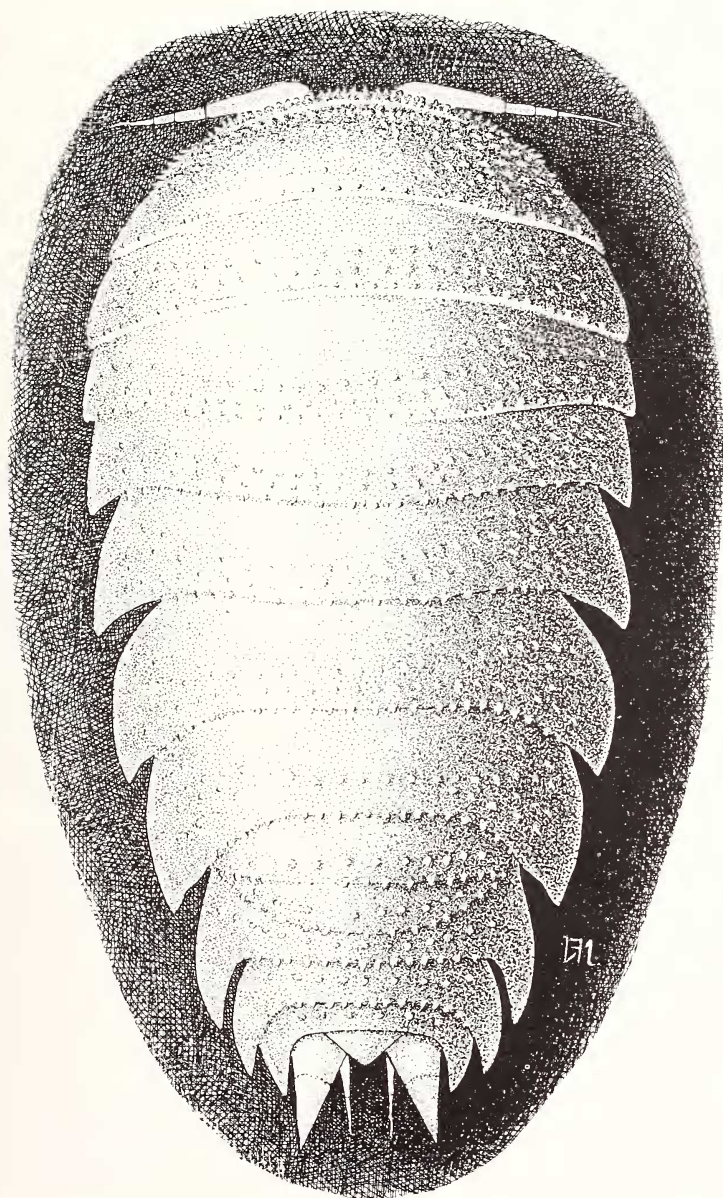


FIG. 1.

Exalloniscus brincki n. sp.: ♂ holotypus.

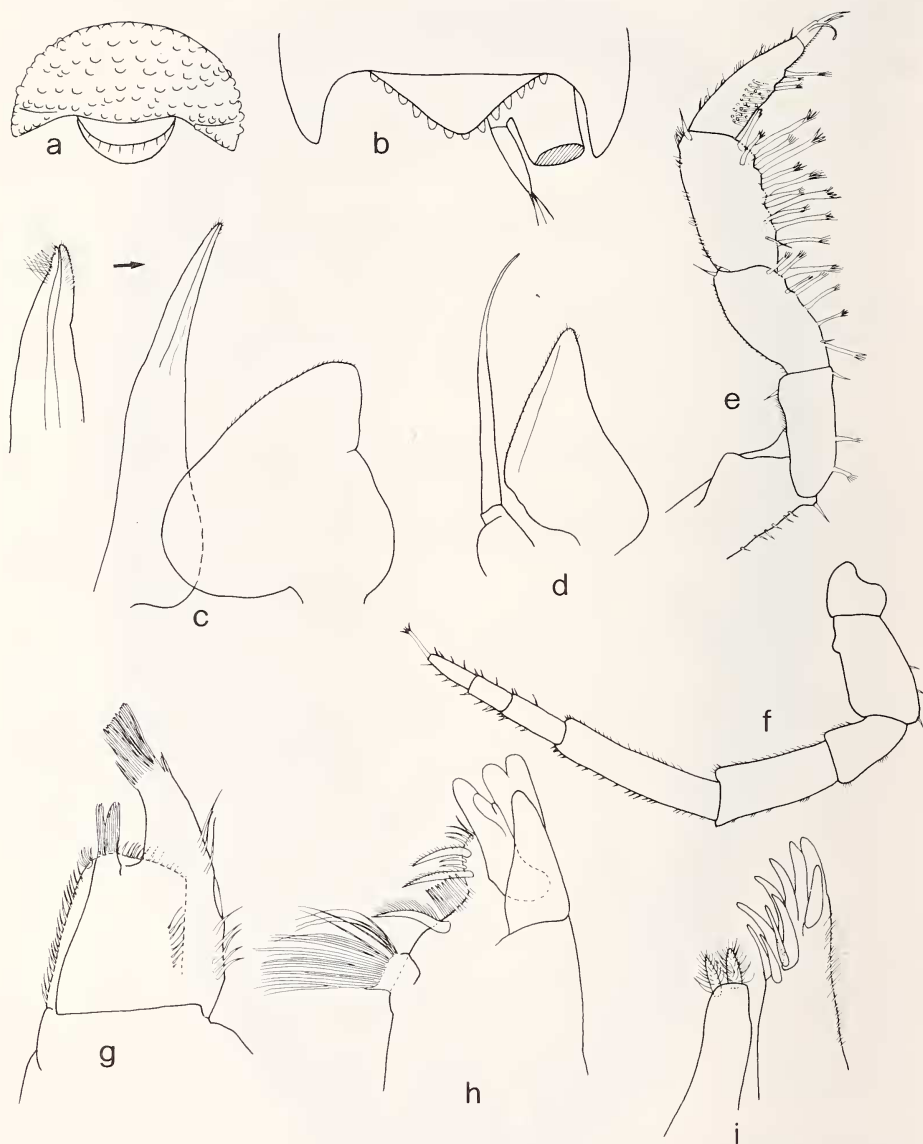


FIG. 2.

Exalloniscus brincki n. sp.: a) cephalon; b) pleon; c) pleopod I, ♂ holotypus; d) pleopod II, ♂ holotypus; e) pereopod I, ♂ holotypus; f) IInd antenna; g) maxilliped; h) mandible; i) first maxilla.

out from the pocket of the tegument. The central one seems to be composed by a system of parallel pipes, the two lateral ones are lined up with a thick web of parallel grooves.

Cephalon deeply sunken in the first pereonite, so that in lateral vision its characteristics are not distinguishable anymore. Lateral lobes subtriangular, frontal lobe rounded, little protruding. Frontal and suprantennal lines present. 2nd antenna short, ratio of flagellum joints: 1, 5: 1: 1.

Pereion: epimeres rounded in the first 3 segments and pointed in the last 4.

Pleon: it continues with the pereion perimeter, pleon epimera III-V with well developed apex. The apex of segment V is longer than the uropod's protopodite.

Telson: triangular, larger than longer, with rounded apex.

Uropods: protopodite posterior margin straight.

Male sexual characters: carpos of pereopod I armed with tough setae feathered at the apex. Basis with ventral protuberance. Exopodite pleopod I: posterior point with rounded apex. Straight endopodite with thin and dense apical setae.

Pleopod II: endopodite longer than the exopodite.

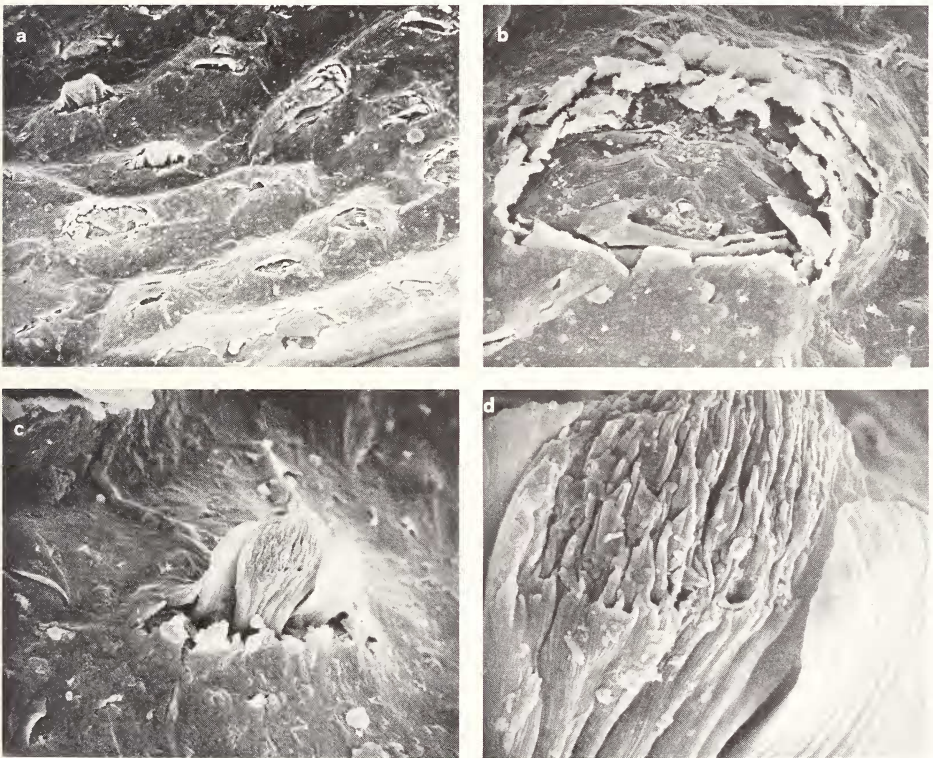


FIG. 3.

Exalloniscus brincki n. sp.: (a, b, c, d)-tegumentary characteristics (S.E.M.), (see text).

ETYMOLOGY: The new species is named for one of the collectors of the Lund University: Prof. Per Brinck.

DISCUSSION: While studying *E. brincki*, we also examined some material, belonging to the same genus, from North Thailand and Philippines (Mindoro Is.).

The male pleopod I endopodite of such specimens, which be the subject of a further study, appears to be quite complex, as those from Java (*E. papillosus*) and Hong Kong (*E. rotundatus*).

As a working hypothesis, it is therefore possible to distinguish two groups within the genus *Exalloniscus*. The first one, composed by *E. rotundatus*, *E. papillosus* and by the specimens cited from Thailand and Philippines, is characterized by a high complexity of the male pleopod I endopodite, and is distributed on the lands surrounding the Southern Chinese Sea.

To this group an other species from Malaysia, at present in study, can be added (FERARA and TAITI, personal communication). The second group, formed by *E. coecus*, *E. albus*, *E. nepalensis*, *E. brincki*, shows the same structure very simplified, and is located in the western part of the range, reaching the Indian subcontinent (Sri Lanka included). To this 2nd group *E. cortii* can also be added; this species occupies the northern part of the range and shows an intermediate condition of complexity.

Considering the paleogeographic history of the lands surrounding the Southern Chinese Sea (AUDLEY-CHARLES, HURLEY and SMITH, 1981), which makes this area an old biogeographical unit, and the low dispersion capacities of the species belonging to this genus, this area could be regarded as the genus dispersal centre, where the widest variety of forms occurred. The presence of *E. coecus* or of similar forms in Malaysia, S. Andaman and India, makes us suppose that the widening of the areal westwards is a relatively recent phenomenon, which led to a simplification of the copulation apparatus structures and to the separation of new species, in conditions of insularity (*E. brincki*) and altitude (*E. nepalensis*). *E. cortii*, in this scheme, probably represents the result of a migration northwards. This is naturally only a working hypothesis, awaiting to be challenged by further data (on behaviour, ecology, morphology, etc.).

RÉSUMÉ

La situation taxonomique actuelle des espèces du genre *Exalloniscus* a été mise au point, et une nouvelle espèce a été décrite: *E. brincki* n. sp. L'étude des appendices sexuelles des mâles nous suggère l'hypothèse d'un centre de dispersion du genre limité aux terres entourant la Mer chinoise méridionale. La nouvelle espèce insulaire, et *E. nepalensis* d'altitude, seraient le résultat d'une successive migration vers l'ouest jusqu'au subcontinent Indien.

BIBLIOGRAPHIE

- ARCANGELI, A. 1958. Le specie di Isopodi terrestri che furono erroneamente assegnate al genere *Allo-niscus* Dana. *Memorie Mus. civ. Stor. nat. Verona*, 6: 239-252, tavv. I-IV.
- ARGANO, R. and C. MANICASTRI. 1979. A new *Akermania* from Sri Lanka (Ceylon) (Crustacea, Isopoda, Armadillidae). *Revue suisse Zool.*, 86: 61-68.

- AUDLEY-CHARLES, M. G., A. M. HURLEY and A. G. SMITH. 1981. Continental movements in the Mesozoic and Cenozoic, pp. 9-23. In: Wallace's line and plate tectonics. *T. C. Whitmore ed.* (1981). *Oxford University press*.
- BUDDE-LUND, G. 1908. Isopoda von Madagaskar und Ostafrika mit Diagnosen verwandter Arten, pp. 263-308, tafn. XII-XVII. In: Voeltzkow, Reise in Ostafrika in den Jahren 1903-1905. *Wiss. Ergebn. (Syst. Arb.) Stuttgart*, Band 2, Heft 4.
- DANA, J. D. 1852. On the Classification of the Crustacea Choristopoda or Tetradecapoda. *Am. J. Sci. Arts*, 14: 297-316.
- DOLLFUS, A. 1898. Isopodes terrestres des Indes Néerlandaises recueillis par M. le Professeur Max Weber et par MM. les Docteurs Fritz et Paul Sarasin (de Bâle). *Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien*, IV, 2. *Leiden*: 357-381.
- FERRARA, F. and S. TAITI. 1982. Ricerche Zoologiche della "Reef 78" alle Andamane. VIII. Isopodi terrestri delle Isole Andamane. *Boll. Mus. civ. Stor. nat. Verona*, 8 (1981): 458-492.
- JACKSON, H. G. 1936. Terrestrial Isopods from Malaysia. *Bull. Raffles Mus.*, 12: 77-87.
- NUNOMURA, N. 1980. Some terrestrial isopod crustaceans from Toyama City, middle Japan. *Bull. Toyama Sci. Mus.*, 2: 13-21.
- SCHMALLFUSS, H. 1983. Terrestrial isopods from Nepal (Crustacea: Isopoda: Oniscoidea). *Senckenbergiana biol.*, 63 (1982): 373-392.
- STEBBING, T. R. R. 1911. Indian Isopods. *Rec. Indian Mus.*, 6: 179-191, tavv. X-XII.
- TAITI, S. and F. FERRARA. Ricerche nell'Asia sudorientale. Su due specie, una nuova, del genere *Exalonicus* Stebbing, 1911 (ISOPODI TERRESTRI). *Boll. Mus. civ. Stor. nat. Verona* (in press).